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Williamsonia fletcheri Williamson (Odonata: Cordulidae) from New England.

By B. ELWOOD MONTGOMERY, Purdue University, Lafayette, Indiana.

A collection of dragonflies made during the summer of 1935 on Mount Desert Island, Maine, and sent for determination by the collector, Dr. William Procter, in October, 1935, contained a female of *Williamsonia fletcheri* Williamson. This specimen was retained for further study when the collection was returned to Doctor Procter, and no record of it was included in the 1938 list of insects of the Mount Desert Region (Procter, 1938). The specimen was soon "lost" and has been found only recently. Doctor Procter has graciously presented the specimen for my collection.

This specimen was collected June 6, 1935 along a carriage road of about three-quarters of a mile, between the Breakneck and Witches' Hole Pond. According to Doctor Procter, "both of these ponds are for the greater part bogs with quite a lot of sphagnum, but not what would be called true sphagnum bogs, and this carriage road between them is a favorite 'hawking' place for dragonflies."

Mrs. Leonora K. Gloyd kindly compared the specimen with a paratopotype female of this species in the Williamson Collection and found them to "agree quite well in every respect except the relative length of the vulvar lamina." In the Mount Desert specimen the lamina is longer than the ninth segment as in the drawing of the allotype female. Mrs. Gloyd's statement indicates that the vulvar lamina of the paratype is somewhat shorter and that there is some variation in this character, or, as she suggested, "apparently its position may change."

W. fletcheri has been recorded from Quebec-Kazubazua and Lanoraie (Walker, 1934), Ontario-Mer Bleue, the type locality, and Lake Timagami (Walker, 1941), Michigan-Manistique (Gloyd, 1932) and Manitoba-Lake Winnipeg and the Saskatchewan River (possibly the same locality). The Manitoba specimens were listed, but not described, as *Diplax vacua* by Hagen in 1867. These specimens were not mentioned by Hagen in 1878 when he described *Cordulia lintneri* from material collected at Center, New York, by Lintner, but they were referred to that species by him in 1890. However, these specimens were said to be *W. fletcheri* by Howe (1923) in his paper on the history and distribution of *W. lintneri.* Although Howe did not state definitely that he had studied the specimens, his statement that specimens from Mer Bleue were intermediate between the Manitoba and the New York specimens, would indicate that he had. In order to remove all doubt concerning the identity of this material I asked Dr. Nathan Banks about the specimens of *Williamsonia* in the Museum of Comparative Zoology and he has kindly furnished the following information (in litt., Feb. 25, 1942).

"We have here six specimens of *Williamsonia,* three of each species. The female type of *lintneri,* another female from Blue Hills, Mass., and a male from Stony Brook, Mass., all have the face pale, the females with vulvar lamina short, the male with nearly straight, tapering appendages. Of *fletcheri* we have the two females that Hagen called *vacua*—Hagen's label "vacua" is still on the Sasketchewan specimen—and a male taken near Harvard, Mass., May 19, 1939 by E. M. Davis. All three have the face dark and slightly bronzy, the females with vulvar lamina nearly one-half longer than in *lintneri,* reaching the tip of segment 9, and the male with superior appendages (from above) elbowed or almost at an angle at basal third."

The capture of the male *fletcheri* near Harvard (Shirley), Mass., was described by Davis (1940) who referred the specimen to *W. lintneri,* however.

Howe (1923) compiled all the records of *Williamsonia* in literature prior to that time and listed additional records (of

lintneri). His data show the distribution of *lintneri* to include Massachusetts, Rhode Island, New York and New Jersey. The only references to new records for this genus since that time, all of which are included in references cited above, appear to refer to *fletcheri*. Dr. Banks wrote that "since then several students have taken one or two a year in the Blue Hills." As the two species now appear to have overlapping ranges in this region such specimens and any additional that can be secured in New England should receive critical study, to furnish further information concerning their relative abundance, etc., more especially as both appear to be very rare and quite local.

The 1935 collection included specimens of certain other rare or interesting species the records of which were not published although these species have since been reported from the Mount Desert region by another collector (Ahrens, 1941). These were *Lanthus albistylus*, 2 ♂♂, July 18, *L. parvulus*, 1 ♂, June 16, and *Ladona julia*, 1 ♀, July 2.

Since this note was written and accepted for publication I have had an opportunity to examine the specimens of *Williamsonia* in the museums and collections at Cambridge and Boston. Those studied included the six specimens in the Museum of Comparative Zoology, those in the Howe Collection (including in addition to several specimens of *lintneri*, two paratopotypes, a male and a female, of *fletcheri*), and a series of about 15 specimens of *lintneri* collected in the Blue Hills by Harry K. Clench and Kenneth Christiansen and in the collection of the latter. The distinguishing characters of the two species, as determined from the examination of this material, may be stated as follows:

Face and frons to base of antennae yellowish or olive brown; yellowish or light brown bands at apical margin on dorsum of abdominal segments 1–9; superior appendages of male almost straight in dorsal view; vulvar lamina of female not reaching beyond the level of caudal margin of tergum of segment 9 ..... *lintneri*

Face and frons dark to black, with metallic purple or bronze reflections; light bands at apical margin of abdominal segments occurring on first four or five segments only and usually confined to intersegmental membrane; superior ap-

pendages of male quite arcuate in dorsal view; vulvar lamina of female reaching beyond the level of caudal margin of tergum of segment 9 ..... *fletcheri*

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The Britton Laboratory.

The recently completed two-story brick building on the grounds of the Connecticut Agricultural Experiment Station, New Haven, will be named the Britton Laboratory, in memory of Dr. Wilton Everett Britton. Dr. Britton, until his death in 1939, was for about forty years entomologist of the Experiment Station and state entomologist. *Science,* Aug. 7, 1942.

Further Notes on Aero-Plankton of Kentucky.

By H. Elliott McClure, Ord, Nebraska.

From May 3, 1934, to June 19, 1934, flying insects were collected twice a day, morning and evening, by means of a net attached to the fender of an automobile. Collections were made along a four-mile stretch of road east of Horse Cave, Kentucky. The pavement was 16 feet wide without broad shoulders which were overgrown with weeds and not mowed during the time of the collections. A few of the fields bordering the road were plowed, but the majority were unplowed and abounded with flowers, especially composites. At one point a woods of oak and maple came to within 100 yards of the route. This region of Kentucky is rolling and underlaid with limestone. There were no open streams along the route, but there were entrances to at least three caves. Most of the surface water drained or seeped into caves underlying this area. In three hollows near the road there was permanent standing water, and there were temporary pools in many others after heavy rains.

At the end of each collecting trip, the net was immediately turned inside out, and the insects dumped into a pint jar of alcohol. Later they were filtered from the liquid and put into a numbered vial. Because of the difficulties involved, several groups have not been determined.

I greatly appreciate the work of the following specialists for making the determinations in the groups indicated: Dr. C. P. Alexander, Amherst, Massachusetts, Tipulidae; Dr. L. G. Strom, Milwaukee, Wisconsin, Aphididae; Dr. J. B. Steinweden, San Francisco, Cal., Thysanoptera; Mrs. Arni Arnason, Saskatoon, Saskatchewan, Syrphidae; Dr. L. L. Buchanan, Washington, D. C., Carabidae; Dr. Dayton Stone, Albany, New York; Cydnidae; Mr. Eugene Ray, Chicago, Illinois, Mordellidae; Dr. W. J. Brown, Ottawa, Canada, Scarabeidae; Dr. H. R. Bryson, Manhattan, Kansas, Elateridae; Dr. W. M. Wheeler, deceased, Formicidae; Dr. L. Haseman, Columbia, Missouri, Psychodidae; Dr. M. W. Blackman, Washington, D. C., Scolytidae; Dr. F. P. Ide, Toronto, Canada, Ephemerida;

Dr. H. Morrison, Washington, D. C., Coccidae; Dr. A. P. Jacot, deceased, Acarina; Dr. J. W. Folsom, deceased, Collembola; Dr. Grace Sandhouse, deceased, Apoidea; Dr. Orlando Park, Evanston, Illinois, Pselaphidae; Dr. J. A. Reeves, St. Petersburg, Florida, Chrysomelidae; Dr. H. C. Fall, deceased, Coleoptera.

The length of day increased from 13.65 hours to 14.5 hours from sunrise to sunset during the seven weeks of observations. This was an increase of .85 hours, or 51 minutes. During May the daily increase in the length of day was greater than during June. On May 11 a heavy dust storm blew in from the west, making the sky hazy and visibility low for three days. There was rain during 14 of the 48 days of observations. Most of this came during the first ten days of June, eight of which had heavy rains. During the time of the evening collections temperatures averaged about five degrees higher than at the time of the morning collections.

There was a total of 16,687 specimens collected by 100 trips over the route during the seven weeks. The average collection included 166 insects, or one insect to 63 cubic feet of air, as the net strained approximately 10,500 cubic feet of air during each drive. The average morning collection included fewer insects, 70, and the average evening collection more, 262, or one insect to 151 cubic feet and 40 cubic feet of air, respectively.

There were two classes and 13 orders represented and, of these, 65 families have been identified. Of those specimens that have been identified to date, there were represented 131 genera and 196 species. Among this group there were 21 species of economic importance as listed by the Committee on Common Names of the American Association of Economic Entomologists. These were: *Anaphothrips obscurus* (Müll.), 30; *Frankliniella tritici* (Fitch), 95; *Thrips tabaci* Lind., 5; *Rhopalosiphum prunifoliae* (Fitch), 94; *Macrosiphum pisi* (Kalt.), 64; *Eriosoma lanigerum* (Hausman.), 2; *Aphis gossypii* (Glover), 5; *Aphis rosea* (Baker), 3; *Aphis baerki* (Cowan), 1; *Macrosiphum granarium* (Kirby), 13; *Aphis illinoisensis* (Thomas), 2; *Anthrenus verbasci* (Linn.), 1; *Stegobium paniceum* Linn., 1; *Ligyrus gibbosus* DeG., 3; *Epitrix parvula*

Fab., 14; *Epitrix fuscula* Crotch, 1; *Epitrix cucumeris* Harr., 1; *Phyllotreta vittata* Chev., 8; *Diabrotica* 12-*punctata* Fab., 1; *Diabrotica vittata* Fab., 1; *Apis mellifera* Linn., 4. The economic species constituted 11 per cent of the identified species, but only 2.1 per cent of the individuals.

Many species were taken only occasionally, and of these 32, or 24 per cent, were taken only in the morning collections, and the remainder, 131, or 76 per cent, were taken only in the evenings. These 32 species included four spiders, one Collembola, two thrips, ten Coleoptera, one Diptera, and ten Hymenoptera. The spiders and Hymenoptera were apparently proportionally most active in the morning, as 75 per cent of the species of spiders were taken then, and 50 per cent of the species of Hymenoptera.

There were 163 species taken once, twice, or occasionally, and 33 species taken regularly or abundantly. Four of the abundant species were most active in the morning. These were the aphid, *Pemphigus lactucae* (Fitch), the coccid males, *Pseudococcus* sp., the ant, *Tapinoma* sp., and the bee, *Halictus illinoensis* Robertson. Six species were taken both morning and evening: two thrips, *Frankliniella tritici* (Fitch) and *Anaphothrips obscurus* (Müll.); one cydnid, *Amnestus pusillus* Uhler; two aphids, *Rhopalosiphum prunifoliae* (Fitch) and *Toxoptera graminum* (Rondani); and one sciarid, *Sciara nacta* Johannsen. The remaining 23 species were taken entirely or mostly in the evenings.

A drop in temperature and cool clear weather seemed to limit or decrease flight activity, as the activity of 31 of the 33 species was reduced or ceased altogether during four cool days preceding May 26. The average temperature at the time of these collections was only 13° F., less than that of the preceding four-day period. Only two species increased in numbers in the collections during this cool period, and these were an aphid, *Macrosiphum pisi* (Kalt.), and a scarabeid, *Aphodius stercorosus* (Melsh.).

Five species showed an apparent increase in activity with rising temperatures and increasing humidity. In most cases the activity of a species fell off after several days of continued

high temperatures. The first ten days of June were wet, and four species showed a decrease during this period which might have been the result of the heavy rains. These were the anthicid, *Anthicus cervinus* Laf., the lathridid, *Corticaria elongata* Gyll., the ant, *Tapinoma* sp., and a psychodid, *Psychoda* sp.

On the basis of the species collected, in nine cases the flight activity of the family was the same as that of the most abundant species, and in three cases the flight activity of the genus was the same as that of the most abundant species in it.

Ten species reached the peak of their activity between May 1 and 15, seven species between May 15 and 31, and 16 species between June 1 and 19. As Table 1 indicates they followed each other in succession.

TABLE 1

Showing the succession of 31 species of insects flying in the air. Figures given are relative. Figure in italics indicates four days of greatest activity.

		May							*June*				
Rank	*Species*	6	10	14	18	22	26	30	3	7	11	15	19
1	Tachistodes testaceus Dej.	*13*	2	2	2	4	0	2					
2	Amnestus pusillus Uhler .	*16*	*21*	3	2	5	0	0	2	1	0		
3	Aphodius distinctus Müll..	2	2	1	0	1							
4	Bibloplectus ruficeps (Leconte)	48	*60*	24	46	22	0	8	24	30	12	8	6
5	Heterocerus pusillus v. limbatus Kies.	5	6	3	5	1	0	4	3				
6	Anthicus cervinus Laf.	1	4	1	3	2	1	4	3	0	2	1	0
7	Pseudocleon sp.	2	8	*10*	4	7	0	2	*10*				
8	Frankliniella tritici (Fitch)	1	6	*18*	6	4	0	5	1	5	10	6	*11*
9	Rhopalosiphum prunifoliae (Fitch)	18	13	*18*	6	4	0	5	4	6	7	6	7
10	Psychoda sp.	4	2	3	5	0	1	1	4			1	
11	Toxoptera graminum (Rondani)		1	1		9		5	7	2	5	1	2
12	Monocrepidius bellus (Say)	1	8	4	12	25		8	12	9	1	1	1
13	Pseudococcus sp.			1		24	1		1				
14	Tomarus pulchellus Pec. .		1	3	1	5			2				1
15	Aphodius stercorosus Melsh.	2		1	2	1	4	1					
16	Macrosiphum pisi (Kalt.)	2	2	5	5	4	8	28	8	1	1		
17	Pemphigus lactucae Gyll.	5	2	5	9	7		2	16	2			
18	Micratopus sp								5	3		2	
19	Tachys laevus Say		1			2			5	2			
20	Corticaria elongata Gyll. .			1	2	0	1	6	17	6	3	16	2
21	Catorama confusum Fall .					2			8		1	1	
22	Sciara nacta Johannsen ..	40	60	24	28	256	12	204	2340		40	48	60
23	Anaphothrips obscurus (Müll.)	0	4	1	0	0	0	1	3	13	7	0	1
24	Anchicera ochracea Casey	1	0	2	1	4	0	3	2	5	2	1	1
25	Typhea fumata Linn.	1	1	0	1	1	0	2	1	8	2	2	1
26	Monotoma americana Aubé	2	4	2	2	6	0	4	5	10	12	2	2
27	Melanophthalma simplex Lec.	3	4	3	3	4	0	2	4	4	6	4	3
28	Halictus illinoensis Robertson		3	1							2	9	
29	Tapinoma sp.					1		0	3	3	1	0	4
30	Pheidole pilifera Robertson										2	5	52
31	Ponera coarctata pennsylvanicus Buckley										1	3	4

There was a progressive increase in the numbers of flying insects encountered in May until the four days preceding the twenty-sixth. During this time there was a drop in temperature and a corresponding drop in the numbers flying. There was a slight increase in numbers in the four days preceding May 22, and during this time there were increasing temperatures and decreasing humidity. In the eight days preceding June 3, with the climax on June 2, a heavy flight coincided with a period of increasing temperature and humidity. As the temperature remained warm and the humidity became variable, the size of the collections decreased.

Following is a discussion of the species collected and identified:

ARANEIDA. Dictynidae, *Dictyna* sp., 1; Linyphiidae, *Microneta* sp., 3; Argiopidae, *Araneus* sp., 1; Thomisidae, *Philodromus lineatus* E., 1; *Misumenops* sp., 1; Micryphantidae, 11. Only 18 spiders were taken during these collections, and most of these were juvenile. No statements can be made of their ballooning activity except that it was erratic at the time of the collections.

ACARINA. Trombidae, 2; Parasitidae, *Gamasus coleoptratorum* Berlese, 5. As mites have no means of flying but floating or riding on insects, they would be in the air only accidentally. The fact that more were taken early in May, whether riding or floating, seems to indicate that they were most abundant then. Furthermore, none were collected in the morning.

COLLEMBOLA. Entomobryidae, *Folsomia quadrioculata* (Tull.), 1, *Lepidocyrtus cyaneus* (Tull.), 1; Sminthuridae, *Bourletiella* sp., 1. Collembola probably were taken only when gusts of wind had knocked them from plants and carried them into the air.

EPHEMERIDA. Ephemeridae, *Pseudocleon* sp., 43, *Caenis* sp., 2; Baetidae, *Baetis* sp., 1, *Ephemerella* sp., 5. Of the 47 Ephemerida taken, only three were collected in the morning. During the first part of May Ephemerida in the collections increased and decreased at a constant rate. They were not taken during the May 26 cool period, and then for about two weeks they were encountered intermittently. After June 7 no more

were caught. The genus *Pseudocleon* was represented by 43 females, and all but two were taken in the evening.

PSOCOPTERA. Of the 133 unidentified psocids, only four were collected in the morning. The evening totals in the collections increased throughout May with but slight drops around the fourteenth and twenty-sixth. The peak came during the four days preceding June 3. From then they decreased rapidly to zero by June 19.

THYSANOPTERA. Thripidae, *Heterothrips* sp., 1, *Sericothrips variabilis* (Beach), 1, *Anaphothrips obscurus* (Müll.), 30, *Frankliniella fusca* (Hinds), 6, *Frankliniella tritici* (Fitch), 95, *Frankliniella nervosa* (Uzel), 1, *Pseudothrips inequalis* (Beach), 1, *Plectothrips antennatus* (Hood), 1, *Thrips* sp., 4, *Thrips tabaci* Lind, 5; Tubulifera, 5; Phlaeothripidae, *Haplothrips leucanthemi* (Schr.), 1, *Phloethrips* sp., 1. Only 180 thrips were taken in flight during the seven weeks of collecting, but in near-by pastures of flowers and weeds it was estimated that there were 3,000 thrips to a square yard. At any one time, apparently, very few of these were flying, especially away from the plants. They seemed to be extremely sensitive to temperature changes, and the numbers declined during the cool periods of the eighteenth and twenty-sixth of May. The morning collections were greatest in May, and the evening total greatest in June. Toward the middle of June the abundance of thrips in the pastures became less, consequently the numbers taken in flight were reduced.

Frankliniella tritici (Fitch). Of the 95 specimens of this species, 47 were taken in the morning and 48 in the evening. The morning collections were highest in May and ceased by May 26, with but a few individuals caught afterwards. The evening collections were low and sporadic during May and gradually increased in June. It is probably that light conditions brought about this change in the time of flight activity.

HEMIPTERA. Enicocephalidae, *Systelloderus biceps* (Say), 7; Miridae, *Adelphocoris rapidus* (Say), 1; Cydnidae, *Amnestus pusillus* Uhler, 52. The only hemipteran taken in any numbers was *Amnestus pusillus* Uhler. They were most abundant in the collections early in May, and ceased to be collected by

June 11 in the evening, and May 26 in the morning. Morning numbers were very small and of no particular importance. The eight days preceding May 30 were cool and dry, but the increasing temperatures and humidity of the first of June apparently brought about a little more activity from the group and a few more were picked up.

(*To be continued in February issue.*)

A New Locality for a Rare Hairstreak (Lepidoptera: Lycaenidae).

Strymon ontario ontario has been found over a large area from Missouri and Arkansas to Ontario and Virginia at least on the southeast, in widely scattered localities; and is "one of the rarest and least known of our eastern butterflies."[1] I am glad, therefore, to report this hairstreak for the first time in Maryland. On June 17, 1942, while searching in company with Carroll E. Wood, Jr., and Neal W. Gilbert for *Strymon titus mopsus* near White Oak, Montgomery County, Maryland, I noticed a hairstreak flutter down into a patch of the milkweed, *Asclepias syriaca.* It crawled up the main stem where I caught it with my fingers and recognized it as a worn but perfect female *S. ontario.* The extensive area of light orange which characterizes the western subspecies *S. O. autolycus* was indicated by a small orange patch on the fore-wings.

A careful search the next day in the vicinity, particularly in the oak forests nearby, revealed no other specimens—a situation similar to that I experienced with *Strymon liparops strigosa,* a single specimen at Hyattsville, Maryland, and a lone *Chrysophanus thoë* at Beltsville, Maryland; localities which were studied over a period of years. The Virginia *Strymon ontario* record was based on two specimens, however, both from near Difficult Run, Fairfax County, collected by Ernest Shoemaker. But like others of these elusive lycaenids, even though the place has been thoroughly scoured by collectors, it has not since been found there either. This species, then, like *Erora lacta,* either must be a stray from the West; or it must have a very local occurrence in peculiar habitats unknown to collectors.

WARREN HERBERT WAGNER, JR., Washington, D. C.

[1] Austin H. Clark, "The Butterflies in Virginia" in *Explorations and Field-Work of the Smithsonian Institution in 1934.* Caption p. 35.

New Food Records of Entomophagous Insects (Hym., Dip., Col., Orth., Hemip.).

By W. V. Balduf, Urbana, Illinois.*

The miscellaneous annotated prey and host records presented below have been obtained (1) largely incidental to other field work I have carried on in recent years, and (2) from several of my associates in biology who generously permit me to include here their observations with mine. Unless noted otherwise, these records have reference to the vicinity of Urbana, Illinois.

Hymenoptera.

1. Telenomus sp., Scelionidae. A series of adults was reared July 1, 1941 from the egg masses of an undetermined tabanid fly on leaves of *Typha* growing at the margin of a small pond.

Diptera.

2. Promachus vertebratus (Say), Asilidae. An adult feeding on a nymphalid butterfly, *Phyciodes tharos* (Dru.) in a field, West Lafayette, Ohio, Aug. 11, 1939: same, preying on an adult of the tiphiid wasp, *Myzine maculata* (Fabr.), Trelease Woods, Aug. 21, 1941; E. J. Koestner, collector.

3. Asilus novaescotiae Macq., Asilidae. An adult preying on a calliphorid fly, *Bufolucilia silvarum* (Mg.), Mahomet, Illinois, June 22, 1940. J. S. Slater, collector.

4. Desmometopa m-nigrum (Zett.), Milichiidae. On September 7, 1940, I found nine adults of this small fly running over and flying about the bodies of two dead honey bees, *Apis mellifica* L. In each case, the bee was dead and in the grasp of an ambush bug, *Phymata pennsylvanica americana* Melin, hiding in flowers. Small numbers of flies, presumably this species, were seen in 1939 and 1941 engaging in similar activities about dead honey bees killed by the same species of ambush bug. The publications of Frost, Knab, de Peyerimhoff and Clausen, cited below, make reference to the bionomics of several species of *Desmometopa*.

* Contribution No. 235 from the entomological laboratories of the University of Illinois. Specialists of the United States National Museum identified many of the insects named in this article.

COLEOPTERA

5. CALOSOMA SCRUTATOR Febr., Carabidae. I found an adult devouring an adult male of the thirteen-year form of the seventeen-year cicada, *Magicicada septemdecim* (L.), in a haw tree at Monticello, Illinois, June 15, 1933: same, I noticed several adults in the same locality on May 13, 1942, on low-hanging branches of various species of roadside trees where they were probably preying on spring cankerworms.

ORTHOPTERA

6. ORCHELIMUM VULGARE Harris, Tettigoniidae. On October 17, 1938, I discovered an adult female *vulgare* sitting on an *Aster multiflorus* and feeding on an adult female of the syrphid fly, *Eristalis dimidiatus* Wied. Because the fly was dead when found, I can not state whether it was captured alive by the hopper or had been seized and killed previously by an ambush bug. The discarded prey of *Phymata* commonly remains lying in the flowers, axils or leaves of ambush plants when these plants are not shaken by winds. If this was an instance of scavengerism, it closely approached predatism, for the exposed muscles of the fly were still firm and flexible. The grasshopper had consumed the head, the venter of the thorax and its contents and the last two abdominal segments and their viscera when my arrival interrupted the meal.

HEMIPTERA.

7. NABIS ROSEIPENNIS Reuter, Nabidae. An adult male dangled an adult tarnished plant bug, *Lygus oblineatus* (Say) from the end of his stylets, October 20, 1938: same, an adult male preyed on an adult of another mirid bug, *Ilnacora stalii* Reuter, at light, June 8, 1941; J. S. Slater, collector: same, a female was observed introducing her beak into a flower head of *Aster multiflorus,* as if feeding, September 22, 1939. While not an instance of predatism, the latter suggests, as do several cases of similar activity I have noticed involving *Phymata,* that sucking entomophags resort to plant fluids, presumably when the preferred insect prey is not available in adequate amount.

8. ZELUS EXSANGUIS Stal, Reduviidae. An adult female simultaneously held two dead prey insects,—an adult ichneu-

monid, *Diplazon laetatorius* (F.) and an adult titaniid fly, possibly *Chloropisca* sp., June 20, 1941.

9. LYGAEUS KALMII Stal, Lygaeidae. On September 7, 1940, my attention was attracted by an adult of this common milkweed bug because it occurred on *Solidago* and stood astride a dead honey bee. Several times, in the course of a few minutes, the bug withdrew its stylets and again inserted them full length into the body of the bee. It is highly probable the bee had been killed by an ambush bug found close by, hence *Lygaeus* may not be classed as predatory, but as a scavenger, perhaps seeking the predigested fluids left by the ambush bug. The bee was stuck fast by its caudal end to the upper surface of a leaf, perhaps by viscid excreta.

10. HETEROCORDYLUS MALINUS Reut., Miridae. J. H. Bigger discovered an adult preying on a fairly large spring canker-worm, *Paleacrita vernata* Peck, at Duncans Mills, Illinois, May 29, 1940.

11. PODISUS MACULIVENTRIS (Say), Pentatomidae. Twelve separate preying records are given here as follows: an adult female feeding on an adult female of the thirteen-year form of *Magicicada septemdecim* in a wild crabapple tree at Monticello, Illinois, June 15, 1933: same, an adult female holding on her stylets a 30 mm. long larva of the phalaenid moth. *Prodenia ornithogalli* Guen., on asparagus, September 25, 1935: same, an adult male holding to the caudal end of a geometrid larva which dangled from the beak; October 15, 1938: same, an adult female feeding on an adult of *Lygus oblineatus,* October 17, 1938: same, on July 25, 1940, I saw a three-fifths grown nymph project its proboscis and thrust its stylets into a 4 mm. long larva of the coccinellid, *Hippodamia* sp., on which it then fed: same, an adult preying on an one inch long phalaenid larva closely related to *Heliothia,* September 16, 1940: same, an adult female was taken in possession of an empidid fly, *Empis clausa* Coq., September 16, 1940: same, an adult preying on an one inch long larva of a *Phalaenidae* sp., September 30, 1940: same, an adult female feeding on an adult of the lacewing, *Chrysopa oculata* Say; taken at light, May 28, 1941, by J. S. Slater: same,

an adult female holding an adult of the chrysomelid beetle, *Trirhabda* sp., June 2, 1941: same, an adult male sucking on an adult of the braconid, *Rogas* sp.; taken June 8, 1941, at light, by J. S. Slater: same, an adult with a half-grown larva of the chrysomelid beetle, *Trirhabda adela* Blake, impaled on its stylets, June 1942; W. K. Bingman, collector.

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A New Polydesmus from Missouri and Oklahoma (Diplopoda).

By RALPH V. CHAMBERLIN, University of Utah, Salt Lake City.

The specimens upon which the new species of *Polydesmus* here described is based were collected by Leslie Hubricht in March and April of 1936. These specimens, with the exception of paratypes deposited in the Academy of Natural Sciences of Philadelphia, are retained in the author's collection.

Polydesmus hubrichti new species.

General color of the dorsum brown, with the legs lighter and the antennae darker.

On the typical tergites the usual two series of well-defined tubercles back of the transverse sulcus, typically six tubercles in each series which extend between bases of the keels. Tubercles in front of sulcus not distinctly separated. Basal area of keels moderately swollen or convex, smooth. The serrations of the keels are sharply defined on anterior tergites but else-

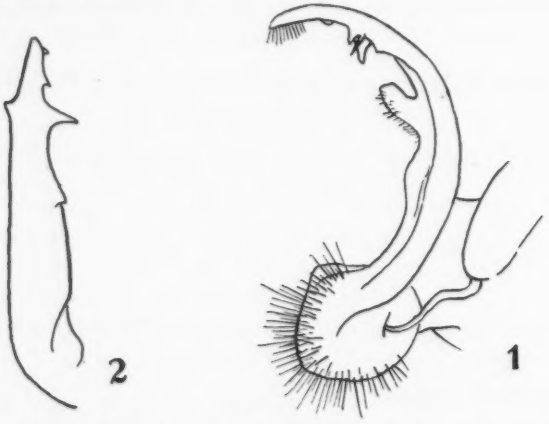
where are weak and on posterior segments almost obliterated; there are two lateral serrations behind that at anterior corner on the non-poriferous keels, three on the poriferous.

Best distinguished by the details of the gonopods of the male which are represented by the accompanying drawings.

Length, up to 17 mm.; width, to 2.7 mm.

Localities—MISSOURI: St. Louis County, University City, March 29, 1936, about 12 specimens, including ♂ holotype, ♀ allotype and ♂ and ♀ paratypes. 4.3 miles northwest of Glencoe Station, March, 1936, one ♀. Creve Coeur Lake Park, March 8, 1936, eight ♂ and ♀ specimens.

OKLAHOMA: Murray County, Arbuckle Mountains, near Latimer County, 2 miles east of Gowen, April 26, 1936, three ♂ and ♀ specimens.



Polydesmus hubrichti sp. n. 1. Right gonopod of male, mesal view. 2. Distal view of blade of same.

Insect Types in the Museum of Comparative Zoology, Harvard College.

The reports by Messrs. Banks and Carpenter in the Annual Report of the Director for 1941–'42 give the types of recent insects catalogued as 25,953 and of fossil insects (holotypes and cotypes) as 1376 species.

Two New Species of Amblyscirtes from Texas and Arkansas (Lepidoptera, Rhopalocera: Hesperiidae).

By H. A. Freeman, White Deer, Texas.

Amblyscirtes erna new species.

♂. Upperside. Primaries. Brown with fulvous overscaling over the entire surface. Two or three very indistinct fulvous subapical spots, otherwise immaculate. The stigma is well developed and is easily discernible because of the presence of lighter fulvous scales below and to the side of it.

Secondaries. Brown with an even overscaling of fulvous scales; some short concolorous hairs toward the base.

Underside. Primaries. Brown, lighter than above especially in the cell; apex and part of the outer margin is shaded slightly darker as is also the base of the wings. The subapical spots reappear as minute, sordid white, dots. Some specimens show two very indistinct spots near the stigma.

Secondaries. Ground color light brown, evenly suffused with gray scales. Some specimens show some very faint lighter markings but the majority are immaculate.

Fringes of both wings faintly checkered. Body above brown; beneath grayish; palpi, sordid white, intermixed with darker gray hairs; antennae, dark brown, ringed with sordid white; club, dark brown above, beneath sordid white.

♀. Similar to the ♂ except larger.

Expanse: ♂, 22–25 mm., average size 24 mm.; ♀, 24–26 mm., average size 25 mm.

Described from 29 specimens, 25 ♂ and 4 ♀. Of these 9 ♂ and 1 ♀ were collected by Don B. Stallings and Dr. J. R. Turner of Caldwell, Kansas, in the Palo Duro Canyon, Texas, during May and June, 1942. The remaining 19 ♂ and 3 ♀ were collected by the author at Palo Pinto, Palo Duro Canyon and Miami, all in Texas, during April, May, June, July and August, 1940 and 1942.

This species is named in honor of the writer's wife who has so generously assisted in his study of the Hesperioidea.

Holotype, ♂, Palo Duro Canyon, Texas; IV–25–42 (H. A. Freeman); and *allotype,* ♀, Palo Duro Canyon, Texas; IV–18–42 (H. A. Freeman); are in the collection of the author. *Paratypes,* 9 ♂ and 1 ♀ are in the collection of Stallings and Turner, Caldwell, Kansas; 15 ♂ and 2 ♀ will be disposed as follows: 2 ♂ to the American Museum of Natural History, New York; 1 ♂ to the United States National Museum; 1 ♂ to the Academy of Natural Sciences of Philadelphia; 1 ♂ to the collection of Mr. A. C. Frederick, Albany, New York; and 1 ♂ to the collection of Mr. Lowell Hulbirt, Glendora, California. The other 11 *paratypes* will remain for the present in the collection of the author.

Erna more closely resembles *aenus* Edwards than any other species of *Amblyscirtes.* In preparing this description *erna* was compared with 31 specimens of *aenus* from Colorado; Palo Duro Canyon and Alpine, Texas, and the following differences were noted: (1) *Aenus* always has three well defined subapical spots. These spots in *erna* are poorly defined or absent. (2) *Aenus* usually has a small spot in interspace Cu_1 and another slightly larger one in interspace Cu_2. *Erna* does not have these spots. (3) The fulvous overscaling on the upper surface of the wings of *aenus* is brighter than it is in *erna.* (4) On the under surface of the primaries the cell area is bright reddish-fulvous in *aenus,* whereas in *erna* this area is scarcely lighter than the rest of the wing. (5) The ground color of the under surface of the secondaries of *aenus* is dark with the overscaling whitish. In *erna* the ground color is lighter than in *aenus* and the overscaling is darker, being grayish. (6) *Aenus* usually has a discal band of whitish spots and two basal spots of the same color on the under surface of the secondaries. These are absent in *erna* or else very poorly defined. (7) *Aenus* is a slightly larger species than *erna.* Comparative measurements show that the males of *aenus* average 27 mm. and the females 28 mm.; the males of *erna* average 24 mm. and the females 25 mm.

Genitalic resemblance in this genus is very great; however careful microscopic examination reveals slight specific differences in the valvae. In *erna* the tooth-like projection at the posterior extremity of the valve is short and serrate similar to

the same projection in *alternata* Grote and Robinson, whereas the general shape of the valve is similar to *cassus* Edwards.

Amblyscirtes linda new species.

♂. Upperside. Primaries. Dark brown with some fulvous overscaling toward the base and inner margin; the number of subapical spots variable, from three well defined to no spots at all. A few specimens show two poorly defined spots in the vicinity of the stigma, one in interspace Cu_1 and the other in interspace Cu_2. The stigma is well developed.

Secondaries. Dark brown with the basal and discal areas of the wings overscaled with fulvous scales and hairs.

Underside. Primaries. Grayish-brown, lighter than above. The cell area is occupied with reddish-fulvous scales. The spots reappear and are better defined, the subapical spots are clear white and the two spots near the stigma are fulvous.

Secondaries. Ground color dark brown, evenly suffused with grayish-white scales; an irregular curved discal band of five or six grayish-white spots, two above the cell and a faintly lighter area near the base. The overscaling almost obliterates the discal band and basal spots in some of the specimens.

Fringes of both wings checkered. Body, above brown; beneath grayish-white; palpi, grayish-white; antennae, dark brown, ringed with gray; club, black above, beneath grayish-white.

♀. Similar to the ♂ except some of them have the discal band and basal spots on the under surface of the secondaries clear snow white.

Expanse: ♂, 24–27 mm., average size 26 mm.; ♀, 24–29 mm., average size 28 mm.

Described from 35 specimens, 24 ♂ and 11 ♀, collected by the author at Hope Hill Farm and Pinnacle Springs, Faulkner County, ARKANSAS, during June and July, 1941 and 1942.

I take great pleasure in naming this species for my daughter.

Holotype, ♂, Hope Hill Farm, Faulkner Co., Arkansas; VII–6–42; and *allotype,* ♀, Hope Hill Farm, Faulkner Co., Arkansas; VI–27–42; are in the collection of the author. *Paratypes,* 23 ♂ and 10 ♀, will be disposed as follows: one pair to the American Museum of Natural History, New York, New York; one pair to the Academy of Natural Sciences, Philadelphia, Pennsylvania; one pair to the United States National

Museum, Washington, D. C.; one pair to the Carnegie Museum, Pittsburgh Pennsylvania; one pair to the collection of Stallings and Turner, Caldwell, Kansas; one ♂ to the collection of Mr. A. C. Frederick, Albany, New York; one ♂ to the collection of Dr. G. W. Rawson, Detroit, Michigan; one ♂ to the collection of Mr. Lowell Hulbirt, Glendora, California; and one ♂ to the collection of Mr. Otto Buchholz, Roselle Park, New Jersey. The other 19 *paratypes* will remain for the present in the collection of the author.

The prevailing species of *Amblyscirtes* in Arkansas is *vialis* (Edwards). To this species and *aenus* Edwards *linda* bears the most resemblance. In preparing this description *linda* was compared with approximately 250 specimens of *vialis* from over most of the United States and several localities in Canada and the following differences were noted: (1) Although a dark species, *linda* is lighter than *vialis*. The tendency in coloration of *vialis* is toward black, whereas in *linda* the tendency is toward brown. (2) *Vialis* lacks the fulvous overscaling present in a large number of the specimens of *linda*. (3) The stigma is more prominent in *linda* than it is in *vialis*. (4) The cell area of the under surface of the primaries of *vialis* is dark and does not show the fulvous overscaling present in *linda*. (5) On the under surface of the primaries the subapical spots begin with three white streaks on the costa of the wing, whereas in *linda* these are never present. (6) *Vialis* lacks the discal band and basal spots present in *linda* and the overscaling is more restricted, while in *linda* it covers all the surface of the wing.

In comparing this species with *aenus* the following differences were noted: (1) *Linda* is a much darker species than *aenus* and the maculation is reduced. (2) The discal band and basal spots on the under surface of the males of *aenus* are better developed than in *linda*, whereas the females of *linda* have these markings better developed than the females of *aenus*. (3) The stigma is better developed in *linda* than it is in *aenus*.

The genitalia somewhat resemble the genitalia of *celia* Skinner, however the posterior projection on the valve is different.

Current Entomological Literature

COMPILED BY THE EDITORIAL STAFF.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of Journals given at the end of the literature. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

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new South American species of Merothrips Hood (Merothripidae). [10] 44 (7): 140–141; 151–154. EWING & FOX. —New neotropical insects of the Apterygotan family Japygidae. [50] 92 (3151): 291–299, ill. FRASER, F. C.—A note on the wing-trichiation of the Odonata. [8] 78 (941): 235–236, figs. GOOD, N. E.—Stenistomera (Siphonaptera): a revaluation of the genus, with the description of a new subgenus and species. [10] 44 (7): 131–139, ill. HOLLAND, G. P.—Synonymy of some fleas from western North America (Siphonaptera). [4] 74 (9): 157–158. KIRBY, H.—Descovinid flagellates of Termites III. The genera Foaina and Parajoenia. [67 Zool.] 45 (3): 167–246, ill. KOHLS, G. M.—Siphonaptera: Ptilopsylla dunni, a new species of bat flea from Panama. [17] 28: 361–362, ill. LEPELLEY, R. H.—A method of sampling thrips populations. [22] 33 (3): 147–148. SCOTT, D. B.—Some Collembola records for the Pacific coast and a description of a new species. [55] 18 (4): 177–186.

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R. L.—Revision of the Termitaphididae. [55] 18 (4): 155–159 (k).

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"Robber flies of Colorado." [103] 15 (4): 124–126, ill. (*). KALMUS, H.—Anemotaxis in Drosophila. [31] 150 (3805): 405. LEES, A. D.—Homology of the campaniform organs on the wing of Drosophila melanogaster. [31] 150 (3804): 375, ill. LINDQUIST & DEONIER.—Emergence habits of the Clear Lake gnat. [103] 15 (4): 109–120. MANGABEIRA, O., FILHO. —Contribuição ao estudo dos Flebotomus, Za, 3a. [111] 36 (2): 201–214, 215–224, ill. (S*). METZ, C. W.—Mosaic salivary glands in Sciara. [90] 76 (767): 623–630, ill. NEEL, J. V.—The polymorph mutant of Drosophila melanogaster. [90] 76 (767): 630–634. PHILIP, C. B.—Further notes on Nearctic Tabanidae. [28] 21: 55–68 (*). ROBERTS, R.—An observation on Promachus, a large robberfly. [103] 15 (4): 134–135. SMITH & ROSENBERGER.—A case of cutaneous myiasis due to the larvae of Cordylobia anthropophaga. [Amer. Jl. Trop. Med.] 22 (4): 459–461, ill. STONE, A.—New species of Anastrepha and notes on others (Tephritidae). [91] 32 (10): 298–304, ill.

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SPECIAL NOTICES.—Meterology of the Virgin Islands. By R. G. Stone. [Sci. Surv. Porto Rico & Virgin Is. N. Y. Acad. Sci.] 19 (1): 1–138.

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Exper. Biology & Medicine. 34.—Bios. Rivista Biol. Sperimen. e Gen., Geneva. 35.—Revista, Sociedad Mexicana Hist. Nat. 40.—American Mus. Novitates. 42.—Jour. of Experimental Zool. 43.—Ohio Jour. of Sciences. 47.—Jour. of Agricultural Research. 50.—Proc. U. S. National Mus. 55.—Pan-Pacific Entomologist. 62.—Bull., Amer. Museum Nat. Hist. 67.—Univ. of California Pub., Entom. 68.—Science, New York. 75.—Annals & Mag. Nat. Hist. 90.—The American Naturalist. 91.—Jour., Washington Acad. Sciences. 103.—Jour., Kansas Entom. Soc. 111.—Memorias, Inst. Oswaldo Cruz.

The Detroit Entomological Society.

After a couple of decades of informal fraternizing, the Detroit Entomological Society has just completed its first year of formal organization with fifteen members. Any entomologist who may visit Detroit is requested to communicate with the secretary, John H. Newman, 14358 Maddelein Ave., or the chairman, George Steyskal, 23341 Puritan Ave., Detroit, Michigan.

Asterocampa celtis in Michigan (Lepidoptera: Nymphalidae).

After returning home from a profitable day of research at the University of Michigan Museum of Zoology on August 23, 1942, the writer opened his front door for fresh air and noticed an unusual butterfly perched on the outside of the screen-door. He rushed around the house with a net and secured the insect, which was identified as *Asterocampa celtis* (Bdv. & Lec.), a species not previously recorded from Michigan. The specimen was turned over to Sherman Moore, who checked its determination and who will deposit it in the University of Michigan Museum of Zoology.—GEORGE STEYSKAL, Detroit, Michigan.

Entomological News for December, 1942, was mailed at the Philadelphia Post Office on January 26, 1943.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Arctic Lepidoptera especially **Noctuidae**—Wanted to hear from collectors who desire the Arctic Species. Have large collection. R. J. Fitch. Lloydminster, Saskatchewan, Canada.

Wanted—Tropical Lepidoptera and Insects. Also domestic species. Will exchange or buy specimens. M. A. Zappalorti, 253 Senator Street, Brooklyn, N. Y.

Wanted—Specimens of the genus Calendra (Sphenophorus) from North America. Will exchange Eastern U. S. Calendra or other Coleoptera for desired species. R. C. Casselberry, 302 Lincoln Avenue, Lansdowne, Penna.

Coccinellidae wanted from all parts of the world, especially South and Central America. Buy or exchange. G. H. Dieke, 1101 Argonne Drive, Baltimore, Md.

I shall be grateful to anyone who will give me any reference where insects taken on Mt. Desert Island, Maine, have been used wholly or in part in describing a species.

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